U.S. Environmental Protection Agency

EPA On-line Tools for Site Assessment Calculation

Estimated Henry's Law Constant

Estimated Henry's Law Constants

Background: Henry's Law Constants characterize the equilibrium distribution of dilute concentrations of volatile, soluble chemicals between gas and liquid. For this calculator, the liquid is water. Temperature-dependence is calculated by two methods: one developed by the EPA Office of Solid Waste and Emergency Response and the other published in the journal *Ground Water* and written by John Washington in 1996. Background information on each method is given on a separate page.

Special background information on methyl *tert*-butyl ether (MTBE) is available

Notes:
1) Chemicals are only included if there is data for the temperature-dependence calculation. Henry's Constants for many petroleum hydrocarbons and oxygenated additives are available from a data set of estimated properties. For other chemicals see the chemical properties page.
2) The unit choices for Henry's constants include atm-m^3/mol, atm, and two separate dimensionless values. These are listed below.
3) Previously the calculator contained some single-temperature values. These have been eliminated from the calculation but are available for reference.

Inputs

Example Data | Calculate | Clear
Save Data | Recall Data | Go Back

Title		
Date		Current Date
Chemical	(PCE) tetrachloroethene or perchloroethene	
Desired Temperature	15 °C	Temperature Map

Results

Henry's Constant Estimates in units of	Hcc	at	15.0 C
OSWER Method	0.441 dimensionless		
Washington (1996) Method	0.415 dimensionless		

Washington (1996) Method

Notes: Value calculated using thermodynamic data reported in Washington, J.W. 1996. Ground Water. Vol. 34. pp. 709-718.

Unit Choices for the Henry's Law Constant

H_{cc} = Concentration/Concentration	(dimensionless--volumetric basis)[1]
H_{yx} = Mole Fraction Y / Mole Fraction X	(dimensionless)
H_{px} = Partial Pressure / Mole Fraction X	(atmospheres)
H_{pc} = Partial Pressure / Solubility	(atm m^3/mol)

[1]The dimensionless form based on concentrations (volumetric basic) is the most commonly used of the dimensionless values. See Staudinger and Roberts, 1996, A Critical Review of Henry's Law Constants for Environmental Applications, in Critical Reviews in Environmental Science and Technology, 26(3):205-297 for more information on various units (specifically page 292).

Top ^
Home | Glossary | Notation | Links | References | Calculators

---

Page author: John Washington/Jim Weaver, of U.S. EPA, Office of Research and Development, Athens Georgia who last modified this content on: May 22, 2005